

South Dayton Dump and Landfill Site - Addendum to the Vapor Intrusion Study Work Plan for the Round 2 Sampling Event

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Conestoga-Rovers & Associates (CRA) is currently performing a Vapor Intrusion (VI) Study at the South Dayton Dump and Landfill site (the Site) in Moraine, Ohio, on behalf of the Respondents to the Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study (RI/FS) of the Site, Docket No. V-W-06-C- 852 (ASAOC). The VI Study is being performed in accordance with the *VI Investigation Work Plan* (USEPA, 2011) and the USEPA Region 5 VI Guidebook (USEPA, 2010).

CRA performed the Round 1 and Round 1 Follow-Up sampling events in January and March 2012, respectively. CRA has submitted the validated analytical data compared to the applicable VI screening levels, and tables of field measurements (e.g., methane and lower explosive limit [LEL]) to USEPA. There have been multiple discussions via conference call and e-mail between CRA and USEPA which have resulted in several modifications to the data collection and evaluation procedures for the VI Study. These modifications are documented in this addendum to the *VI Investigation Work Plan* (USEPA, 2011) and they will be applicable to the Round 2 sampling event that will be performed in late July and early August 2012, and the potential Round 2 follow-up sampling event.

Modification 1 – Evaluation of Combustible Gases

CRA determined that in addition to methane, other non-methane combustible gases were contributing to measured LEL concentrations at two of the VI Study buildings; Building 2 on Parcel 5054 [Valley Asphalt Quonset Hut] and Building 1 on Parcel 5173 [SimTrainer]). The *VI Investigation Work Plan* (USEPA, 2011) did not account for the potential for this to occur. Additionally, CRA determined that the RKI GX-2003 was not an appropriate field instrument for measuring LEL in subslab soil gas because it does not function properly in low oxygen conditions such as those observed at the Site; therefore, it will no longer be used for the VI Study.

The following procedures will be implemented to evaluate both methane and non-methane combustible gases in Round 2:

1. Methane concentrations and the LEL resulting from methane will be measured pre- and post- sample (i.e., collection of Summa canisters for TO-15 analysis) using a LandTec GEM 2000 fitted with a carbon filter.
2. The LEL from total combustible gases will be measured pre- and post- sample with a LandTec GEM 2000 (i.e., without the carbon filter). However, it is important to note that the LandTec GEM2000 is designed to provide an LEL value based on the detector's response to methane (e.g., calculated based on the LEL for methane which is 5 percent by volume); if other combustible gases are present they could respond differently and have a different LEL (e.g., the LEL for gasoline is approximately 1.4 percent by volume).
3. At least one of the two methane/LEL measurements (i.e., either pre- or post-sample) will be collected during "the heat of the day" which is anticipated to occur between 12 and 8 PM in late July and early August based on historical weather information from the Weather Underground website.
4. If concentrations of methane or LEL are detected at any of the indoor air, crawl space air, or subslab soil gas sample locations, then the following additional analyses will be performed at that location:

- a. CRA will collect a separate Summa canister for lab analysis of methane, ethane, and ethene by ASTM method D1946
 - b. CRA will request that the analytical laboratory measure and report all hydrocarbons between C1 and C12. CRA should provide detailed information to USEPA for approval prior to the Round 2 sampling event on the procedures the laboratory will use to analyze and report these results. If CRA proposes to have the laboratory report the extended TO-15 list (including tentatively identified compounds [TICs]), then detailed information is needed regarding what the laboratory will produce for results, and how the C1-C3 data will be captured. For example, it is unclear if the laboratory is going to report analytical results for individual alkanes (e.g. hexane, heptanes, etc.), or all compounds (e.g. branched alkanes, alkenes, etc.) present in the samples. Similarly, if CRA proposes to have the lab report TPH (C5 to C12), then additional information should be provided on the method of calibration and how the C1-C4 data will be captured.
5. Confirmatory sampling for methane (i.e., laboratory analysis for methane by ASTM Method D1946 from 20% of the total number of samples for each media excluding outdoor air [subslab soil gas, and indoor/crawl space air]) is no longer required. However, laboratory analysis for methane will be performed if concentrations of methane or LEL are detected as described in #4 above.
 6. The methane screening levels based on percentages of LEL presented in Section 5.2.2 of the *VI Investigation Work Plan* (USEPA, 2011) are also applicable to the total combustible gas LEL measurements (e.g., the Soil Vapor Screening Level [SVSL] for rapid response is 10 percent of the LEL so if the total combustible gas LEL measurement is greater than 10 percent of the LEL, then this screening level is exceeded).

Modification 2 – Sampling Procedures

The following modifications will be made to the sampling procedures for the Round 2 sampling event(s):

1. The indoor air samples will be collected under typical operating conditions at each building in order to capture occupied warm weather building conditions and minimize disruption to building occupants. This may include open doors and/or windows if such conditions are typical throughout warm weather months. Decisions regarding building conditions during sampling will be made during the sampling event in conjunction with USEPA's onsite representative. CRA will record the building conditions during sampling (e.g., HVAC operation, open window and/or doors).
2. In order to identify and address any potential issues with the sub-slab soil vapor probe, CRA may complete leak testing the day prior to sample collection, in order to reduce delays in sampling.
3. All Summa canisters used for the collection of samples from industrial and residential buildings in the VI Study will be batch and individually certified, respectively, by the analytical laboratory to ensure they are free of contamination before collecting the samples.

Modification 3 – Additional VI Study Buildings

USEPA requested and the Respondents agreed via phone and e-mail conversations in June 2012 to add select buildings on the following parcels to the VI Study: 2943, 3251, 3255, 3257, 3258, 3262, 3263, and 5223. A total of nine additional buildings were selected as detailed below –

- One residential building on each of Parcels 3251, 3255, 3257, 3258, 3262, 3263
- Parcel 2943 – two residential trailer buildings (with semi-permanent skirts)
- Parcel 5223 – one commercial building

The information available about the selected buildings and the proposed sampling plans are provided on the attached Table 1.

Building surveys will be performed at these buildings in the beginning of the Round 2 sampling event. The sampling locations at these buildings will be selected during the building survey in conjunction with USEPA's onsite representative and will be approved by USEPA (figures showing the sampling locations will be submitted via

e-mail to USEPA within 3 days of the building survey). The sampling will then be performed at these buildings during the Round 2 sampling event after USEPA approval of the sampling locations is confirmed. The Conceptual Site Models (CSMs) for these buildings will be included with the data evaluation submitted after the Round 2 sampling event.

Modification 4 – Building Information and Sampling Plans

Building surveys were originally performed in June 2011 at the VI Study buildings and descriptions of those buildings were provided in the *VI Investigation Work Plan* (USEPA, 2011). Since that time additional buildings have been surveyed, building conditions have changed at some buildings, and additional building characteristic information has been discovered. All of this information should be captured in the report that will be generated to document the results of the VI Study. This includes information regarding the likely underground storage tank (UST) discovered on the north side of Building 1 on Parcel 5174 (Command Roofing).

Some of the new/revised building information has changed the sampling plans for buildings that were included in the *VI Investigation Work Plan* (USEPA, 2011). Additionally, indoor air sampling was performed during the Round 1 follow-up sampling event at the VI Study buildings where volatile organic compounds (VOCs) (including naphthalene) were measured above the screening levels for further investigation in subslab soil gas or crawl space air. Indoor air sampling at these buildings will also be performed in Round 2 in accordance with the *VI Investigation Work Plan* (USEPA, 2011). There are four buildings which will not be sampled during Round 2 because mitigation of the VI pathway is already planned based on the Round 1 results.

Table 1 of the *VI Investigation Work Plan* (USEPA, 2011), which presents a summary of the building survey information and the sampling strategy for each of the VI Study buildings has been updated to reflect this information and is attached.

Modification 5 – Radon Sampling

Concurrent indoor air and subslab soil gas radon samples were collected from some of the Round 1 follow-up sampling buildings (i.e., buildings where Round 1 subslab soil gas VOC sample results exceeded the SVSLs for further evaluation) to calculate empirical subslab-soil-gas-to-indoor-air attenuation factors (AFs) due to the presence of potential indoor VOC sources. Radon sampling will be performed again at those buildings in Round 2 as detailed in the attached Table 1. The Respondents may also elect to perform radon sampling at any of the other VI Study buildings.

The radon sampling procedures are as follows:

1. Indoor air radon samples will be collected prior to opening any of the subslab probes in a building.
2. The subslab soil gas samples for radon analysis will be collected immediately after the indoor air samples for radon analysis.
3. Outdoor air samples for radon analysis will be collected in the vicinity of the buildings where radon sampling is performed.
4. The radon samples will be collected in 1-liter gas sampling bags using lung boxes with pump flow rates set to 200 mL/min. The gas bags will not be filled completely to allow for expansion during shipment via aircraft.
5. The radon samples will be analyzed for Radon-222 by EPA Method Grab Sample/Scintillation Cell Counting (GS).

The radon subslab soil gas and indoor air results will be used to calculate empirical AFs for each building. The empirical AFs for each building will be used to determine if VOCs (including naphthalene) detected in indoor air samples are the result of vapor intrusion or related to indoor/outdoor sources (i.e., if measured indoor air concentrations exceed those predicted from subslab soil gas concentrations multiplied by the empirical attenuation factor then it will be concluded that the measured indoor air concentrations are at least partially related to indoor/outdoor sources). The outdoor air radon results will be used to determine if indoor air radon

concentrations may be all or partially related to outdoor air (i.e., the empirical AF would be lower if outdoor air is causing all or part of indoor air radon concentrations).

References

United States Environmental Protection Agency (USEPA) – Region 5 Vapor Intrusion Guidebook, October 2010 (USEPA, 2010).

United States Environmental Protection Agency (USEPA) – Vapor Intrusion Investigation Work Plan for the South Dayton Dump and Landfill Site, November 2011 (USEPA, 2011).